

Interactive Web Visualization of Birth and Pregnancy Trends by Maternal Age, Race and Ethnicity, and Marital Status: United States, 1909–2013

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What can visualization tools do?

Mega data integration
in sizes and formats

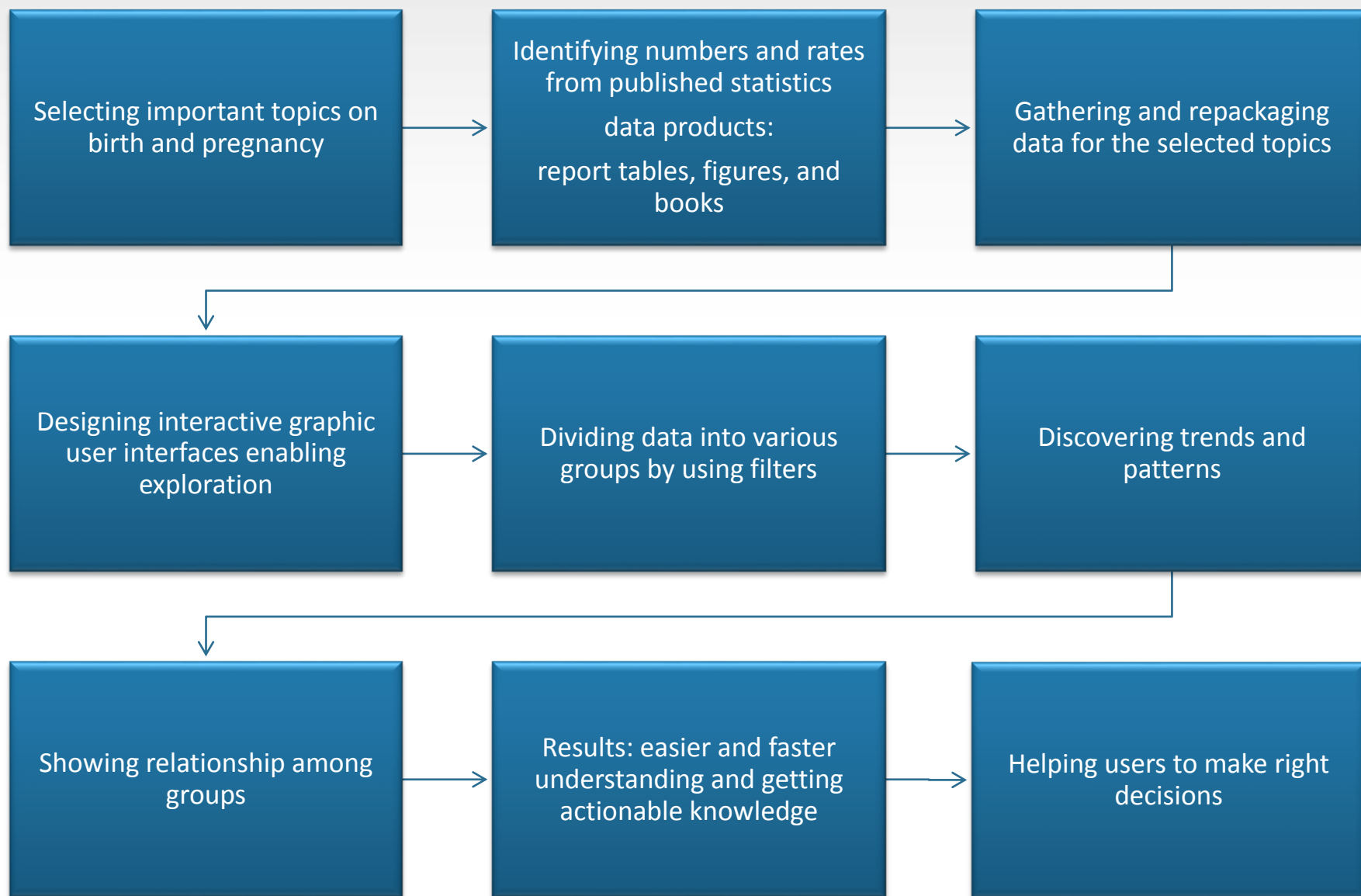
Analyses and graphics
rendering combined

Dynamic and
interactive user
interface

Automated
real time reporting

Instant publication and
sharing

How can data visualization help data analysis?



What methods are used for data visualization?

Selecting a topic and gathering and packaging published datasets in the correct format



Developing visualization worksheets, dashboards, and storyboards in Tableau Desktop Professional



Publishing to Tableau Public Server and embedding the short code to a story on the pilot NCHS Data Visualization Gallery Site

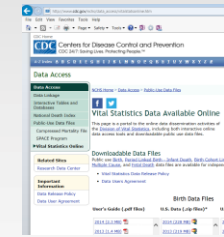
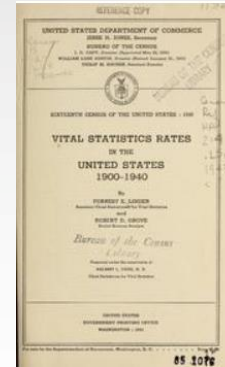
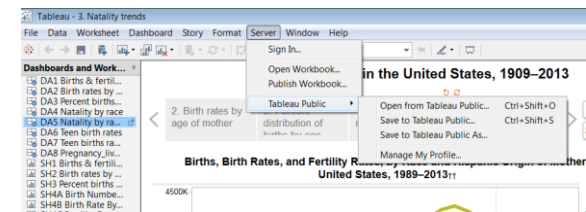
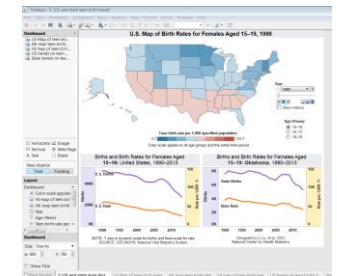
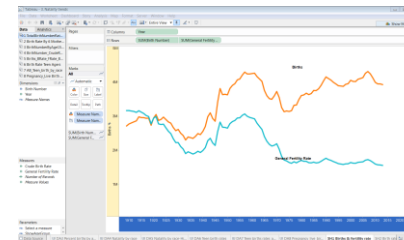


Table 11. Birth rates, by age of mother, United States and each state, 2004

Age-specific fertility rates (ASFR) are the number of live births per 1,000 women aged 15-44 years, estimated in each year. Total fertility rates are the sum of ASFRs for 5-year age groups multiplied by 5. Birth rates by age are based on 1,000 women in specified age groups estimated in each year. Population estimated as of July 1. Rates have been revised using population estimates based on the 2003 census, and may differ from rates previously published as "Preliminary Rates".

State	Total		15-19 years									
	Rate	Fertility rate	15-14	15-13	15-12	15-11	15-10	15-9	15-8	15-7	15-6	15-5
United States	16.0	8,450.5	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Alabama	15.1	8,263.5	1.0	31.1	20.4	48.2	112.9	112.9	72.4	20.9	9.1	0.0
Alaska	15.1	8,263.5	1.0	31.1	20.4	48.2	112.9	112.9	72.4	20.9	9.1	0.0
Arizona	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Arkansas	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
California	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Colorado	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Connecticut	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Delaware	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
District of Columbia	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Florida	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Georgia	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Hawaii	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Idaho	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Illinois	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Indiana	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Iowa	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Kansas	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Kentucky	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Louisiana	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Maine	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Maryland	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Massachusetts	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Michigan	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Minnesota	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Mississippi	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Missouri	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Montana	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Nebraska	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Nevada	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
New Hampshire	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
New Jersey	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
New Mexico	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
New York	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
North Carolina	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
North Dakota	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Ohio	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Oklahoma	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Oregon	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Pennsylvania	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Rhode Island	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
South Carolina	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
South Dakota	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Tennessee	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Texas	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Utah	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Vermont	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Virginia	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Washington	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
West Virginia	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Wisconsin	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0
Wyoming	16.4	8,497.0	0.4	40.5	21.6	49.7	105.5	114.0	94.0	45.0	9.0	0.0

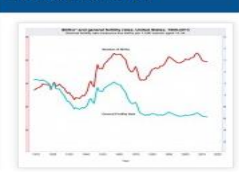
Year	State	State Data Year	State	Age (Years)	State Rate	State Births	U.S. Births	U.S. Birth Rate
2012	Alabama	2012	Alabama	15-19	39.2	6,195	305388	29.4
2012	Alaska	2012	Alaska	15-19	34.5	817	305388	29.4
2012	Arizona	2012	Arizona	15-19	37.4	8,119	305388	29.4
2012	Arkansas	2012	Arkansas	15-19	45.7	4,349	305388	29.4
2012	California	2012	California	15-19	26.5	34,890	305388	29.4
2012	Colorado	2012	Colorado	15-19	25.4	4,154	305388	29.4
2012	Connecticut	2012	Connecticut	15-19	15.1	1,889	305388	29.4
2012	Delaware	2012	Delaware	15-19	25	761	305388	29.4
2012	District of Columbia	2012	District of Columbia	15-19	38.6	791	305388	29.4



Results

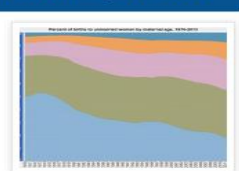
Published on CDC website: three storyboards/dashboards on U.S. births and pregnancies from 1909 to 2013

Nativity trends, United States, 1909–2013



General trends in the number, rate, and percent distribution of births

Births to unmarried women, United States, 1970–2013



Pregnancy, births rates, and percent distributions of births to unmarried women

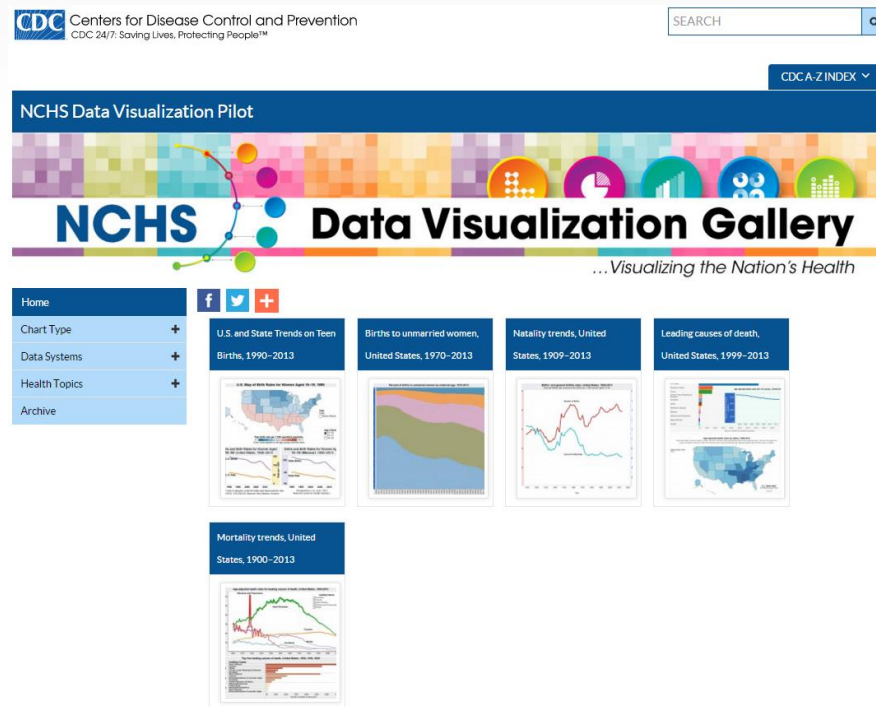
U.S. and State Trends on Teen Births, 1990–2013



State births and state birth rates to teenage women

A demonstration of the data visualization gallery

- <http://blogs.cdc.gov/nchs-data-visualization/>



Conclusions

- Flexible, expressive, and interactive data visualization is useful in analyzing and presenting data for selected topics by exploration
- Dynamic: allow filtering, exploration, and drilling down
- Combine multiple data sources in one dashboard—easy to find, insightful information such as trends, patterns, and relationships
- New data can be added to the data source and the data visualization can be updated automatically and republished quickly
- An important adjunct to disseminating vital data
- Put end users in the driver's seat—fast creation of charts of interest
- Easy sharing with support for existing security and section 508 compliance

Acknowledgments

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- DVS Mortality Statistics Branch: Betzaida Tejada-Vera
- DVS Information Technology Branch: Chief, Rajesh Virkar, Steve Steimel, and Teddy Weldeamlak
- Office of Information Services: Anthony Lipphardt
- Office of Information Technology: John Dolinka